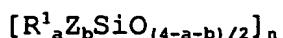


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CLAIMS

1. A method of deinking printed paper, the method comprising pulping the paper to form an aqueous slurry, adding a deinking additive to the paper, and removing detached ink by flotation, wherein the additive comprises an organo-modified siloxane comprising units of the formula:



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in which each R^1 is independently selected from a hydrogen atom, an alkyl, aryl, alkenyl, aralkyl, alkaryl, alkoxy, alkanoyloxy, hydroxyl, ester or ether group;

each Z is independently selected from an alkyl group substituted with an amine, amide, carboxyl, ester, or epoxy group, or a group $-R^2-(OC_pH_{2p})_q(OC_rH_{2r})_s-R^3$;

n is an integer greater than 1;

a and b are independently 0, 1, 2 or 3;

R^2 is an alkylene group or a direct bond;

20 R^3 is a group as defined for R^1 or Z above;

p and r are independently an integer from 1 to 6;

25 q and s are independently 0 or an integer such that $1 \leq q + s \leq 400$;

and wherein each molecule of the organo-modified siloxane contains at least one group Z .

2. A method according to claim 1 wherein Z is a group $-R^2-(OC_pH_{2p})_q(OC_rH_{2r})_s-R^3$.

30 3. A method according to claim 2 wherein p and/or r are independently 2, 3 or 4.

4. A method according to claim 2 or 3 wherein q and s are

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each independently integers from 10 to 30.

5. A method according to claim 4 wherein q and s are each independently 15 to 25.

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6. A method according to any one of claims 2 to 5 wherein p is 2, r is 3, and q and s are both 18.

7. A method according to any preceding claim wherein R² is 10 a methylene, ethylene, propylene, butylene, pentylene or hexylene group.

8. A method according to any preceding claim wherein R³ is a hydrogen atom or a hydroxyl group.

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9. A method according to any preceding claim wherein the siloxane is linear.

10. A method according to any preceding claim wherein the 20 siloxane contains branching.

11. A method according to any preceding claim wherein Z is a group -R²-(OC_pH_{2p})_q(OC_rH_{2r})_s-R³, and R³ is a hydroxyl or alkanoyloxy group.

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12. A method according to any preceding claim wherein 2 to 20 mole percent of silicon atoms in the siloxane molecule are substituted by a group Z.

30 13. A method according to claim 12 wherein 5 to 16 mole percent of silicon atoms in the siloxane molecule are substituted by a group Z.

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14. A method according to any preceding claim wherein the siloxane has a hydrophilic/lipophilic balance (HLB) in the range of 5.0 to 7.3.

5 15. A method according to any preceding claim wherein the siloxane has a molecular weight in the range of 1,000 to 500,000.

16. A method according to claim 15 wherein the siloxane has
10 a molecular weight in the range of 10,000 to 100,000.

17. A method according to any preceding claim wherein the siloxane is a hydroxy-endcapped linear polydimethylsiloxane having an HLB of 5.9 to 6.3, in which 10 to 12 mole percent
15 of silicon atoms are substituted by Z groups of the formula
 $-R^2-(OC_pH_{2p})_q(OC_rH_{2r})_s-R^3$, in which p is 2, r is 3 and q and s are both 18, R² is an alkylene group having from 1 to 6 carbon atoms or a direct bond, and R³ is a hydrogen atom or a hydroxyl, ester or ether group.

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18. A method according to any preceding claim wherein the additive further comprises one or more components selected from a polydimethylsiloxane, an organic polyether, and a fatty acid.

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19. A method according to claim 18 wherein the additive further comprises an organic polyether of the formula R⁴-(OC_pH_{2p})_q(OC_rH_{2r})_s-R⁵ in which R⁴ and R⁵ are selected from a hydrogen atom, hydroxyl, alkyl and alkoxy groups, p and r are independently an integer from 1 to 6, and q and s are independently 0 or an integer such that 1 ≤ q + s ≥ 400.

20. A method according to claim 18 or 19 wherein the additive

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further comprises a fatty acid which is a saturated or unsaturated monobasic aliphatic carboxylic acid.

21. A method according to claim 20 wherein the carboxylic acid is selected from lauric, myristic, palmitic, stearic, arachidic, behenic, lignoceric, palmitolic, oleic, linoleic, linolenic, and arachidonic acids.

22. A method according to any preceding claim wherein the additive is an emulsion.

23. A method according to claim 22 wherein the additive is a gum based self-emulsifying siloxane.

15 24. A method according to any preceding claim wherein the additive is added to the paper in an amount within the range 0.1 to 1 wt% of the paper.

25. A method according to claim 24 wherein the additive is added to the paper in an amount within the range 0.1 to 0.5 wt% of the paper.

26. A method according to any preceding claim which is performed at substantially neutral pH.

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27. A method substantially as hereinbefore described.